1. A reservoir for use in a closed blood sampling system, the reservoir comprising:

a rigid wall;

a flexible membrane overlying at least part of the rigid wall and sealingly secured thereto to define a variable volume chamber therebetween;

an inlet port and an exit port in fluid communication with the chamber;

the flexible membrane having a minimum volume position spaced closely adjacent the rigid wall to define a minimum volume at which fluid still flows between the inlet and outlet through the chamber, the flexible membrane being able to flex out of the minimum volume position to an expanded volume position; and

a drive surface adapted to engage against the flexible membrane to hold the membrane in the minimum volume position.

2. The reservoir of claim 1, the rigid wall including a stem adapted to cooperate with a mounting bracket for mounting to a support.

3. The reservoir of claim 1, the rigid wall having a shape and the flexible membrane generally conforming to the shape of the rigid wall.

4. The reservoir of claim 1, the rigid wall having a shape and the drive surface generally conforming to the shape of the rigid wall.

5. The reservoir of claim 1, the rigid wall including a channel formed therein, with the channel having a portion thereof in fluid communication with the chamber in at least the expanded volume position.

6. The reservoir of claim 5, the channel being in fluid communication with the inlet port and the exit port.

7. The reservoir of claim 6, the channel being an open channel formed in a surface of the rigid wall.

8. The reservoir of claim 6, at least a portion of the channel being completely enclosed by the rigid wall.

9. The reservoir of claim 8, a substantial portion of the channel being completely enclosed by the rigid wall.

10. The reservoir of claim 1, the flexible membrane having a lower surface, the rigid wall engaging against at least a portion of the lower surface in the minimum volume position.

11. The reservoir of claim 1, the drive surface being fluidly isolated from the chamber.

12. The reservoir of claim 1, the flexible membrane having an upper surface, the drive surface engaging against substantially the entire upper surface when in the minimum volume position.

13. The reservoir of claim 1, the drive surface being positioned to move the membrane toward the rigid wall so as to reduce the volume of the chamber in a first direction of movement of the drive surface.

14. The reservoir of claim 13, the movement of the drive surface in the first direction causing a stepwise decrease in the volume of the chamber.

15. The reservoir of claim 1, the flexible membrane being able to flex away from the rigid wall to the expanded volume position in a second direction of movement of the drive surface.

16. The reservoir of claim 15, the movement of the drive surface in the second direction causing a stepwise increase in the volume of the chamber.

17. The reservoir of claim 1, the drive surface being coupled to the flexible membrane.

18. The reservoir of claim 17, the flexible membrane including a nipple.

19. The reservoir of claim 18, the drive surface adapted to couple to a nipple.

20. The reservoir of claim 1, the rigid wall being generally bowl shaped.

21. The reservoir of claim 20, the bowl shaped rigid wall being one of hemispherical, conical, and oval in shape.

22. The reservoir of claim 20, the rigid wall having an upper edge.

23. The reservoir of claim 20, the flexible membrane being generally bowl shaped.

24. The reservoir of claim 20, the drive surface being generally bowl shaped.

25. The reservoir of claim 22, the upper edge traversing at least one of a circular and elliptical path.

26. The reservoir of claim 22, the inlet and exit ports being adjacent the upper edge.

27. The reservoir of claim 23, the bowl shaped membrane being one of hemispherical, conical, and oval in shape.

28. The reservoir of claim 23, the flexible membrane having an upper edge.

29. The reservoir of claim 28, the upper edge traversing at least one of a circular and elliptical path.

30. The reservoir of claim 1 further comprising a plunger, the plunger comprising:

a shaft having a first and second end portion, the first end portion coupled to the drive surface; and

a knob coupled to the second end potion of the shaft for manipulation by a user.

31. The reservoir of claim 30 further comprising a housing overlying at least part of the flexible membrane and coupled to the rigid wall.

32. The reservoir of claim 31, at least one of the housing and plunger being adapted to fixedly secure the drive surface in the minimum volume position.

33. The reservoir of claim 31, at least one of the housing and plunger being adapted to fixedly secure the drive surface in a maximum expanded volume position.

34. The reservoir of claim 31, the housing having a lower edge.

35. The reservoir of claim 32, the housing further comprising a detent, the plunger further comprising a recess, the plunger fixedly securing the drive surface in the minimum volume position when the detent engages the recess.

36. The reservoir of claim 33, the housing further comprising a detent, the plunger further comprising a recess, the plunger fixedly securing the drive surface in a maximum expanded volume position when the detent engages the recess.

37. The reservoir of claim 34, the lower edge traversing at least one of a circular and elliptical path.

38. A closed blood sampling system comprising:

tubing adapted to be coupled between a fluid supply and a circulatory system of a patient;

a reservoir disposed in the tubing comprising:

a rigid wall;

a flexible membrane overlying at least part of the rigid wall and sealingly secured thereto to define a variable volume chamber therebetween;

an inlet port and an exit port in fluid communication with the chamber,

the flexible membrane having a minimum volume position spaced closely adjacent the rigid wall to define a minimum volume at which fluid still flows between the inlet and outlet through the chamber, the flexible membrane being able to flex out of the minimum volume position to an expanded volume position; and

a drive surface adapted to engage against the flexible membrane to hold the membrane in the minimum volume position; and

a sampling site disposed in the tubing intermediate the patient and the reservoir adapted to draw blood from the tubing.

39. The closed blood sampling system of claim 38, the rigid wall having a shape and the flexible membrane generally conforming to the shape of the rigid wall.

40. The closed blood sampling system of claim 38, the rigid wall having a shape and the drive surface generally conforming to the shape of the rigid wall.

41. The closed blood sampling system of claim 38, the rigid wall including a channel formed therein, with the channel having a portion thereof in fluid communication with the chamber in at least the expanded volume position.

42. The closed blood sampling system of claim 41, the channel being in fluid communication with the inlet port and the exit port.

43. The closed blood sampling system of claim 42, the channel being an open channel formed in a surface of the rigid wall.

44. The closed blood sampling system of claim 42, at least a portion of the channel being completely enclosed by the rigid wall.

45. The closed blood sampling system of claim 44, a substantial portion of the channel being completely enclosed by the rigid wall.

46. The closed blood sampling system of claim 38, the flexible membrane having a lower surface, the rigid wall engaging against at least a portion of the lower surface in the minimum volume position.

47. The closed blood sampling system of claim 38, the drive surface being fluidly isolated from the chamber.

48. The closed blood sampling system of claim 38, the flexible membrane having an upper surface, the drive surface engaging against substantially the entire upper surface when in the minimum volume position.

49. The closed blood sampling system of claim 38, the drive surface being positioned to move the membrane toward the rigid wall so as to reduce the volume of the chamber in a first direction of movement of the drive surface.

50. The closed blood sampling system of claim 38, the flexible membrane being able to flex away from the rigid wall to the expanded volume position in a second direction of movement of the drive surface.

51. The closed blood sampling system of claim 38, the drive surface being coupled to the flexible membrane.

52. The closed blood sampling system of claim 38 further comprising a plunger, the plunger comprising:

a shaft having a first and second end portion, the first end portion coupled to the drive surface; and

a knob coupled to the second end potion of the shaft for manipulation by a user.

53. The closed blood sampling system of claim 52 further comprising a housing overlying at least part of the flexible membrane and coupled to the rigid wall.

54. The closed blood sampling system of claim 53, at least one of the housing and plunger being adapted to fixedly secure the drive surface in the minimum volume position.

55. The closed blood sampling system of claim 53, at least one of the housing and plunger being adapted to fixedly secure the drive surface in a maximum expanded volume position.

56. The closed blood sampling system of claim 54, the housing further comprising a detent, the plunger further comprising a recess, the plunger fixedly securing the drive surface in the minimum volume position when the detent engages the recess.

57. The closed blood sampling system of claim 55, the housing further comprising a detent, the plunger further comprising a recess, the plunger fixedly securing the drive surface in a maximum expanded volume position when the detent engages the recess.

58. A method of sampling blood in a closed blood sampling system wherein the sampling system has tubing intermediate a fluid supply and the circulatory system of a patient, a reservoir disposed in the tubing having a rigid wall, a flexible membrane overlying at least part of the rigid wall and sealingly secured thereto to define a variable volume chamber therebetween, an inlet port and an exit port in fluid communication with the chamber, the flexible membrane with a minimum volume position spaced closely adjacent the rigid wall to define a minimum volume at which fluid still flows between the inlet and outlet through the chamber, the flexible membrane being able to flex out of the minimum volume position to an expanded volume position, a drive surface adapted to engage against the flexible membrane to hold the membrane in the minimum volume position, and a sampling site disposed in the tubing intermediate the patient and the reservoir adapted to draw blood from the tubing, the method comprising:

flexing the membrane away from the minimum volume position to an expanded volume position so as to provide whole blood at the sampling site;

drawing whole blood from the sampling site; and,

flexing the membrane toward the minimum volume position so as to discharge fluid in the reservoir to the patient.

59. The method of claim 58 further comprising attaching the reservoir to a mounting bracket to mount the reservoir to a support.

60. The method of claim 58 wherein flexing the membrane away from the minimum volume position comprises forcibly flexing the membrane away from the minimum volume position.

61. The method of claim 60 wherein forcibly flexing the membrane away from the minimum volume position comprises:

coupling the drive surface to the flexible membrane; and

moving the drive surface in a second direction of movement away from the rigid wall.

62. The method of claim 58 wherein flexing the membrane toward the minimum volume position comprises forcibly flexing the membrane toward the minimum volume position.

63. The method of claim 62 wherein forcibly flexing the membrane toward the minimum volume position comprises moving the drive surface in a first direction of movement toward the rigid wall.

64. The method of claim 58 further comprising:

disposing a valve intermediate the fluid supply and the reservoir; and

closing the valve prior to flexing the membrane away from the minimum volume position to an expanded volume position.

65. The method of claim 64 wherein flexing the membrane away from the minimum volume position comprises flexing the membrane using fluid pressure of the patient's circulatory system.

66. The method of claim 58 wherein flexing the membrane toward the minimum volume position includes flexing the membrane into contact with a portion of the rigid wall.

67. A reservoir for use in a closed blood sampling system, the reservoir comprising:

a lower housing having a rigid wall with an opening;

a flexible membrane sealingly secured to the lower housing and closing off the opening to define a variable volume chamber therebetween;

an inlet port and an exit port in fluid communication with the chamber;

an upper housing coupled to the lower housing;

the flexible membrane having a minimum volume position spaced closely adjacent the rigid wall to define a minimum volume at which fluid still flows between the inlet and outlet through the chamber, the flexible membrane being able to flex out of the minimum volume position to an expanded volume position; and,

a moveable plunger having a first portion received through the upper housing and having a drive surface fluidly isolated from the chamber, the drive surface being coupled to the flexible membrane, and a second portion for manipulation by a user, such that movement of the plunger in a first direction forcibly flexes the membrane toward the expanded volume position to draw fluid from a patient to the reservoir so as to provide whole blood at a sampling site intermediate the patient and reservoir, and movement of the plunger in a second direction flexes the membrane toward the minimum volume position to discharge the fluid in the reservoir to the patient.

68. The reservoir of claim 67, the rigid wall including a stem adapted to cooperate with a mounting bracket for mounting to a support.

69. The reservoir of claim 67, the rigid wall having a shape and the flexible membrane generally conforming to the shape of the rigid wall.

70. The reservoir of claim 67, the rigid wall having a shape and the drive surface generally conforming to the shape of the rigid wall.

71. The reservoir of claim 67, the rigid wall including a channel formed therein, with the channel having a portion thereof in fluid communication with the chamber in at least the expanded volume position.

72. The reservoir of claim 71, the channel being in fluid communication with the inlet port and the exit port.

73. The reservoir of claim 72, the channel being an open channel formed in a surface of the rigid wall.

74. The reservoir of claim 72, at least a portion of the channel being completely enclosed by the rigid wall.

75. The reservoir of claim 74, a substantial portion of the channel being completely enclosed by the rigid wall.

76. The reservoir of claim 67, the flexible membrane having a lower surface, the rigid wall engaging against at least a portion of the lower surface in the minimum volume position.

77. The reservoir of claim 67, the flexible membrane having an upper surface, the drive surface engaging against substantially the entire upper surface when in the minimum volume position.

78. The reservoir of claim 67, the flexible membrane including a nipple.

79. The reservoir of claim 78, the drive surface adapted to couple to a nipple.

80. The reservoir of claim 67, at least one of the housing and plunger being adapted to fixedly secure the drive surface in the minimum volume position.

81. The reservoir of claim 67, at least one of the housing and plunger being adapted to fixedly secure the drive surface in a maximum expanded volume position.

82. A reservoir for use in a closed blood sampling system, the reservoir comprising:

a lower housing having a rigid wall with an opening;

a flexible membrane sealingly secured to the lower housing and closing off the opening to define a variable volume chamber therebetween;

an inlet port and an exit port in fluid communication with the chamber;

an upper housing coupled to the lower housing;

the flexible membrane having a minimum volume position spaced closely adjacent the rigid wall to define a minimum volume at which fluid still flows between the inlet and outlet through the chamber, the flexible membrane being able to flex out of the minimum volume position to an expanded volume position; and

a moveable plunger having a first portion received through the upper housing and having a drive surface fluidly isolated from the chamber, and a second portion for manipulation by a user, such that movement of the plunger in a first direction flexes the membrane toward the expanded volume position under fluid pressure of a patient's circulatory system so as to provide whole blood at a sampling site intermediate the patient and reservoir, and movement of the plunger in a second direction flexes the membrane toward the minimum volume position to discharge the fluid in the reservoir to the patient.

83. The reservoir of claim 82, the rigid wall including a stem adapted to cooperate with a mounting bracket for mounting to a support.

84. The reservoir of claim 82, the rigid wall having a shape and the flexible membrane generally conforming to the shape of the rigid wall.

85. The reservoir of claim 82, the rigid wall having a shape and the drive surface generally conforming to the shape of the rigid wall.

86. The reservoir of claim 82, the rigid wall including a channel formed therein, with the channel having a portion thereof in fluid communication with the chamber in at least the expanded volume position.

87. The reservoir of claim 86, the channel being in fluid communication with the inlet port and the exit port.

88. The reservoir of claim 87, the channel being an open channel formed in a surface of the rigid wall.

89. The reservoir of claim 87, at least a portion of the channel being completely enclosed by the rigid wall.

90. The reservoir of claim 89, a substantial portion of the channel being completely enclosed by the rigid wall.

91. The reservoir of claim 82, the flexible membrane having a lower surface, the rigid wall engaging against at least a portion of the lower surface in the minimum volume position.

92. The reservoir of claim 82, the flexible membrane having an upper surface, the drive surface engaging against substantially the entire upper surface when in the minimum volume position.

93. The reservoir of claim 82, at least one of the housing and plunger being adapted to fixedly secure the drive surface in the minimum volume position.

94. The reservoir of claim 82, at least one of the housing and plunger being adapted to fixedly secure the drive surface in a maximum expanded volume position.

95. A reservoir for use in a closed blood sampling system, the reservoir comprising:

a lower housing having a rigid wall with an opening;

a flexible membrane sealingly secured to the lower housing and closing off the opening to define a variable volume chamber therebetween;

a channel formed in the rigid wall having an inlet port and an exit port, the channel in fluid communication with the chamber along at least a portion of the channel;

the flexible membrane having a minimum volume position with at least a portion of a lower surface of the membrane engaging the rigid wall to define a minimum volume at which fluid still flows between the inlet and outlet through the chamber, the flexible membrane being able to flex out of the minimum volume position to an expanded volume position; and

a drive surface adapted to engage against the flexible membrane to hold the membrane in the minimum volume position.

96. The reservoir of claim 95, the channel being an open channel formed in a surface of the rigid wall.

97. The reservoir of claim 95, at least a portion of the channel being completely enclosed by the rigid wall.

98. The reservoir of claim 97, a substantial portion of the channel being completely enclosed by the rigid wall.

99. The reservoir of claim 95, the drive surface being positioned to move the membrane toward the rigid wall so as to reduce the volume of the chamber in a first direction of movement of the drive surface.

100. The reservoir of claim 95, the flexible membrane being able to flex away from the rigid wall to the expanded volume position in a second direction of movement of the drive surface.

101. The reservoir of claim 95, the drive surface being coupled to the flexible membrane.

102. The reservoir of claim 95 further comprising a plunger, the plunger comprising:

a shaft having a first and second end portion, the first end portion coupled to the drive surface; and

a knob coupled to the second end portion of the shaft for manipulation by a user.

103. A reservoir for use in a closed blood sampling system, the reservoir comprising:

a lower housing having a rigid wall with an opening;

a flexible membrane sealingly secured to the lower housing and closing off the opening to define a variable volume chamber therebetween;

an inlet port and an exit port;

a channel in a surface of the rigid wall and extending between the inlet port and exit port, the channel being exposed to the chamber through an open top of the channel;

the flexible membrane having a minimum volume position closing off the open top of the channel without interfering flow between the inlet and outlet through the channel, the flexible membrane being able to flex out of the minimum volume position to an expanded volume position; and

a drive surface adapted to engage against the flexible membrane to hold the membrane in the minimum volume position.

104. The reservoir of claim 103, the drive surface being positioned to move the membrane toward the channel so as to reduce the volume of the chamber in a first direction of movement of the drive surface.

105. The reservoir of claim 103, the flexible membrane being able to flex away from the channel to the expanded volume position in a second direction of movement of the drive surface.

106. The reservoir of claim 103, the drive surface being coupled to the flexible membrane.

107. The reservoir of claim 103 further comprising a plunger, the plunger comprising:

a shaft having a first and second end portion, the first end portion coupled to the drive surface; and

a knob coupled to the second end portion of the shaft for manipulation by a user.

108. A reservoir for use in a closed blood sampling system, the reservoir comprising:

a lower housing having a rigid wall with an opening;

a flexible membrane sealingly secured to the lower housing and closing off the opening to define a variable volume chamber therebetween;

an inlet port and an exit port;

a channel extending through the lower housing between the inlet port and exit port in fluid isolation from the chamber;

an access aperture in the rigid wall fluidly communicating between the channel and the chamber;

the flexible membrane having a minimum volume position sealing off the access aperture, the flexible membrane being able to flex out of the minimum volume position to an expanded volume position thereby unsealing the access aperture; and

a drive surface adapted to engage against the flexible membrane to hold the membrane in the minimum volume position.

109. The reservoir of claim 108, the drive surface being positioned to move the membrane toward the access aperture so as to reduce the volume of the chamber in a first direction of movement of the drive surface.

110. The reservoir of claim 108, the flexible membrane being able to flex away from the access aperture to the expanded volume position in a second direction of movement of the drive surface.

111. The reservoir of claim 108, the drive surface being coupled to the flexible membrane.

112. The reservoir of claim 108 further comprising a plunger, the plunger comprising:

a shaft having a first and second end portion, the first end portion coupled to the drive surface; and

a knob coupled to the second end portion of the shaft for manipulation by a user.